How much is too much?

By United Press International

The New York State Worker's Compensation Board ruled this year that Samuel Yannon died seven years ago from a disease caused by chronic exposure to microwave transmissions from atop the Empire State Building.

It is the first documented case of a man killed by microwave radiation, a form of non-ionizing radiation.

Everyone is exposed to some degree of non-ionizing radiation, much of it generated naturally by the sun. But some people are exposed to greater levels than others — especially with the increase of manmade sources since the invention of radio and the recent proliferation of microwave communications.

People who work on radar and communications transmitters, live near transmitters, operate citizens band radios, use microwave ovens and operate radio frequency heat sealers — devices used in plywood and plastics manufacturing — all are exposed to higher degrees of non-ionizing radiation than the general population.

Recent research indicates non-ionizing radiation levels lower than 10 milliwatts per square centimeter — the voluntary exposure limit suggested by the American National Standards Institute — have biological effects.

But the unanswered question is: Are these effects health hazards?

The levels of non-ionizing radiation to which Samuel Yannon was exposed are unknown, but his employer, New York Telephone, said Yannon was never exposed to more than 10 milliwatts per square centimeter.

The disease that killed Yannon, who for 15 years worked on the Empire State Building transmitters, was believed to be Alzheimer's disease, a rapidly advancing form of senility.

"He was deteriorated," said Yannon's widow, Antoinette, from her Staten Island home. "He was cooked from the inside out. Even his brain was cooked."

New York Telephone was ordered in February to pay Mrs. Yannon $28,000, but is appealing the decision.

Non-ionizing radiation is that portion of the electromagnetic spectrum not known to cause molecular breakdown, cancer and other deadly health hazards associated with nuclear radiation — or ionizing radiation.

It is used in all forms of wireless data transmission, such as television and radio broadcasts, radar and long distance telephone calls.

It also produces heat in microwave ovens and in industrial heat sealers. It emanates from television picture tubes and video display computer terminals. Visible light is a form of non-ionizing radiation.

"We may need to look at people who are chronically exposed to high levels (of microwave radiation)," said biological engineer W. Ross Adey. "We should find out if this kind of exposure can promote Alzheimer's disease."

Adey is doing research on the biological effects of non-ionizing radiation at the Veterans Administration hospital in Loma Linda, Calif.

His work is part of an annual $18 million federally funded research effort to help the Environmental Protection Agency form a scientific basis to determine safe levels of human exposure to non-ionizing radiation and set mandatory regulations to control exposure.

ANSI's 10-milliwatt exposure limit has been adopted by the Department of Labor's Occupational Safety and Health Administration as a mandatory standard for safety in the workplace.

OSHA spokesman Jim Foster said the standard had not been enforceable until this year because OSHA investigators did not have the necessary equipment. He said OSHA investigators have just begun training on how to measure field strengths.

ANSI secretary Stephen Caine, an electrical engineer in the Electromagnetic Environmental Effects Division of the Navy's Naval Electronics Systems Command, said ANSI is considering reducing the 10-milliwatt limit for exposure to 1 milliwatt per square centimeter and 5 milliwatts for microwave frequencies because of studies indicating possible biological effects at 10 milliwatts.

If the standard is recommended, EPA then will consider adopting it as a mandatory environmental regulation.

But it would not be until 1983 that such a regulation could become law, said Richard A. Tell, a physicist with EPA's Office of Radiation Programs in Las Vegas.

Non-ionizing radiation is used in all forms of wireless data transmission, such as television and radio broadcasts and long distance telephone calls. It also emanates from television picture tubes and video display computer terminals.

"It's a very frustrating matter," Tell said. "The process has been dragging because of a lack of resources — funds and people — to tackle the overall problem and make a reasonable and scientific answer.

"I wish Congress would push for developing a standard, because then maybe we'd get the money to do it, but the problem is, we don't have a history of deaths or medical problems attributed to electromagnetic fields where we could do a good epidemiological study."

According to Tell, 99 percent of the population is exposed to a maximum of one-thousandth of the lower one milliwatt standard now under consideration by ANSI.

The health concern is that such radiation can heat human tissue the same way a microwave oven heats food and can cause permanent damage. There is also a concern that lower levels of radiation may have an adverse effect on nerves and glands that control metabolism.

OSHA estimates that between 40,000 and 80,000 workers operate heat sealers. Some of these heat sealers are known to produce more than 10 milliwatts per square centimeter.

A recent survey by the National Institute of Occupational Safety and Health of more than 200 radio frequency heat sealers found that about 60 percent were creating field strengths greater than 10 milliwatts per square centimeter.

Another health hazard alleged by Dr. Milton Zaret, an ophthalmologist from Scarsdale, N.Y., is that exposure to low level microwaves can cause cataracts.

Zaret, consulted by the CIA in the mid-1960s when it was discovered the Soviet Union was radiating the American Embassy in Moscow with low levels of microwave transmissions, said several of his patients — radar technicians and people who use video display terminals — developed cataracts because of their exposure.

He claims to have identified a certain type of cataract that he calls a microwave cataract.

However, Adey said other ophthalmologists have told him that Zaret's theory is considered erroneous because the type of cataract Zaret described is not unique to people exposed to microwave radiation.

Past research has focused on the heating effects of microwave and radio frequency radiation, but current research is aimed at determining if the non-heat-related effects pose health hazards.